REMARKS

Claims 56 and 57 have each been amended to recite "a nanoscopic conductor." Support for these amendments can be found in the specification, for example, on page 6, line 21 to page 7, line 12. Accordingly, no new matter has been added.

Claims 1, 3, 5, 7-10, 13, 14, 16-18, 20-23, 56-59, 90-104, 107-112, and 114-117 are pending for examination.

Applicants note that a slightly different listing of the claims is given in the Office Action Summary. However, based on the rejections given in the Office Action itself, and the Applicants' previous response, it is believed that the claims listed above are the ones currently pending.

Rejections in view of Melzner

Claims 56-58 have been rejected under 35 U.S.C. §102(b) as being anticipated by, or under 35 U.S.C. §103(a) as being obvious over, Melzner, *et al.*, U.S. Patent No. 5,774,414 ("Melzner").

It is not seen where in Melzner is there a disclosure or a suggestion of a nanoscopic conductor produced by a process comprising forming the conductor, and transporting the conductor onto a surface, as is recited in claims 56 and 57, as amended. The Patent Office's point concerning product-by-process recitations is noted, but the Patent Office appears to have ignored the distinction in the product as recited; it is noted that this *product* distinguishes Melzner. While Melzner discloses micromechanical systems, made by various lithographic-type processes, it is not seen where Melzner teaches nanoscopic systems as recited in the claims as rejected. A product including a nanoscopic conductor transported, after formation, to an electrical crossbar array as claimed is different from a product formed by the Melzner *in situ* lithography-type process, and this distinction would readily recognized upon examination of the product. Further, it is not seen where Melzner suggests or motivates one of ordinary skill in the art to make a nanoscopic system as recited. Accordingly, it is believed that claims 56 and 57 are not anticipated or rendered obvious by Melzner. Claim 58 is dependent on claim 57 and is believed to be allowable for at least the same reasons. Thus, it is respectfully requested that the rejection of these claims be withdrawn.

Rejections in view of Melzner and Brandes

Claims 1, 3, 5, 7-10, 13, 14, 16-18, 20-23, 59, 90-104, and 107-117 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Melzner and Brandes, *et al.*, U.S. Patent No. 6,445,006 ("Brandes").

To the extent that claim 59 is rejected on this ground, it is noted that this claim is dependent upon claim 57, which does not stand rejected on this ground. Thus, it is believed that the rejection of claim 59 is improper.

The Patent Office has not yet explained which structures in Melzner could be combined or modified with which structures in Brandes, and what would motivate one of ordinary skill in the art to do so. The Patent Office states that one of ordinary skill in the art would "capitalize on the semi-conductive properties of carbon nanotubes." However, the Patent Office has not explained how this statement teaches one of ordinary skill in the art which structures of Melzner and Brandes would be combined to form a functional device, nor has the Patent Office indicated where the prior art provides any guidance or direction to one of ordinary skill in the art as to making the proposed combination.

Melzner's device has bistability, based upon internal compressive stresses within an enlarged portion of a conductor, in either its "up" or "down" configuration, with the "down" configuration involving contact with another conductor. The shift between the "up" and "down" configurations appears to be similar to action of a type of toy "clicker" device. Not only is it unclear how this action would be achieved with substitution of nanotubes as taught by Brandes, but it seems clear that those of ordinary skill in the art would expect such a device to fail, based on the teachings of Melzner and Brandes alone (without the benefit of knowledge of the Applicants' invention). Brandes teaches no properties of nanotubes that would lead one to expect they could be substituted for the Melzner conductor which is switched into one of two positions held by internal compressive stresses.

Specifically, Melzner describes bistable circular diaphragms (see Fig. 2B) that can be moved from a "concave up" to a "concave down" position (see, e.g., Fig. 2G). The circular diaphragms (5 in this figure) move upward and downwards to contact a "sharp point" on a lower substrate (10 in

this figure). Brandes discloses carbon nanotubes that contact a substrate on one or both ends (see, e.g., Fig. 4).

If the circular diaphragm in Melzner were replaced by a carbon nanotube, it is not clear how the carbon nanotube would be fixed (whether at one end, or at both ends) and how or whether they could be placed under compressive strength to maintain bistability (or made bistable in any other way), or how contact with the sharp point on the lower substrate would be guaranteed. If the carbon nanotube was only fixed at one end, as is taught in Brandes, it is not seen how the carbon nanotube would be able to move between two bistable states, i.e., a "concave up" or "concave down" state. If more than one carbon nanotube were used, it is not clear how the carbon nanotubes would all be fixed or manipulated such that the carbon nanotubes would all be "concave up" and a "concave down," i.e., such that the sharp point on the lower substrate would receive one signal, and not multiple or inconsistent signals from the multiple carbon nanotubes. Additionally, it is not clear whether the carbon nanotubes would be fixed in their middles, in order to approximate the circular diaphragm in Melzner, or whether the carbon nanotubes would be fixed on their ends, to put the carbon nanotubes under the proper compressive stress necessary to guarantee that the carbon nanotubes would all be bistable, i.e., in a "concave up" or "concave down" state. However, on the other hand, if the sharp point on the lower substrate were instead the component replaced by the carbon nanotube, it is not clear how the carbon nanotube would have the necessary stiffness in order to contact the circular diaphragm, as the carbon nanotube would likely be movable, as is taught in Brandes (see, e.g., Fig. 2, which shows carbon nanotubes having more than one position). If all components of Melzner were replaced with the carbon nanotubes of Brandes, then it is also not clear how the device would be made or used. Fig. 9B of Brandes is not helpful in regard; it is not seen how this figure, and its related description, is consistent with substitution in the bistable device of Melzner.

In short, the Patent Office has not provided any objective teaching, suggestion or motivation that would lead one of ordinary skill in the art to combine Melzner and Brandes in order to create a functioning, workable device, as is required for a proper *prima facie* showing under 35 U.S.C. §103(a). Consequently, it is believed that this combination is improper.

Moreover, in making this combination, besides a teaching, suggestion, or motivation, one of ordinary skill in the art must believe that there is a reasonable expectation of success that the combination could be formed. See MPEP §2143.02. It is believed that a person of ordinary skill in the art would not reasonably expect success in combining Melzner and Brandes. Melzner describes a system in which diaphragms are stably held in one of two bistable positions by compressive stress of the enlargements/diaphragms 5 in the two positions. Movement of the Melzner device between these two positions can be carried out, for example, by a force caused by heating a gas with a laser, or by using other pneumatic forces (col. 2, lines 60-67). As examples, the gases must be heated to a temperatures of "a few hundred degrees Celsius [col. 3, lines 2-3]," and the increase in pressure "must be on the order of magnitude of 1 atmosphere] [col. 3, lines 1-2]." It is not seen how it would be expected that such a system would translate into use with a nanotube, per Brandes.

In conclusion, the Patent Office has not indicated how Melzner and Brandes could be combined to form a workable device with a reasonable expectation of success, and has not indicated, beyond the unsupported statement "to capitalize on the semi-conductive properties of carbon nanotubes," why one of ordinary skill in the art would be motivated to do so, especially given the above-described complexities involved in attempting to form a combination of these references. Accordingly, for at least the above-described reasons, it is respectfully requested that the rejection of claims 1, 3, 5, 7-10, 13, 14, 16-18, 20-23, 59, 90-104, 107-112, and 114-117 be withdrawn (claim 113 having previously been cancelled).

CONCLUSION

In view of the foregoing amendments, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this response, that the application is not in condition for allowance, the Examiner is requested to call the undersigned at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

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Respectfully submitted,

By _____
Timothy J. Oyer, Ph.D.
Registration No.: 36,628
Tani Chen, Sc.D.
Registration No.: 52,728
WOLF, GREENFIELD & SACKS, P.C.
Federal Reserve Plaza
600 Atlantic Avenue
Boston, Massachusetts 02210-2206
(617) 646-8000

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